

## GANGRENE OF COLON AND ILEUM AFTER OPERATION FOR APPENDICITIS.<sup>1</sup>

BY NATHANIEL PENDLETON DANDRIDGE,

OF CINCINNATI,

Professor of Surgery in the Miami Medical College.

THE case which I have to report is one in which extensive gangrene of the ileum and cecum resulting in an artificial anus occurred after an operation for appendicitis. After an unsuccessful attempt at relief by a lateral anastomosis between the small intestine and transverse colon, an end-to-end anastomosis with a Murphy button was partially successful, leaving, however, a fecal fistula. This was finally closed after two more operations.

March 25, 1901, I was asked by Dr. Joseph Eichberg to see L. B., aged twenty-six years, who was suffering from an attack of appendicitis. Within two years he had had eight attacks of varying severity; none, however, requiring rest in bed for more than a day or two. The present attack had commenced some ten days before; the symptoms, mild in character, had been persistent, but at the time first seen had come to a standstill, and, indeed, seemed to be on the decline. There was a marked tumor in the right side in the region of the appendix. The outline towards the median side could be well defined; above, below, and to the outer side the limits were not so well marked. The tumor was not very sensitive to pressure, though rigidity of the abdominal wall was present. The temperature was 101.4° F., and the pulse but slightly above normal. As the symptoms seemed to indicate improvement, it was decided to wait until all fever had subsided, and then operate. After a few days, however, fever and pulse both increased, and it was decided to operate at once. This was done March 31. The incision was made at the outer edge of the rectus muscle. Opening the cavity, the appendix could not be found. We came, however, on the mass

---

<sup>1</sup> Read before the American Surgical Association, May 13, 1903.

which gave rise to the tumor found at the first examination, on the inner side of the colon and above the ileocecal valve. This was beneath the peritoneum, bound down to the psoas muscle and overlapping its inner edge. It was thought to be a mass of exudation about the appendix, and I at once proceeded to enucleate it with the finger. When partly separated, a vessel of some size was seen to penetrate and pass through it, so that the pulsation could be felt beyond. It was necessary, therefore, to ligate the vessel before removal was completed. The parts removed proved to be some enlarged glands about the size of a hen's egg. They appeared to belong to the iliac chain of lymphatics, and were presumed to be tuberculous. This view, however, was not sustained by the subsequent microscopic examination, and they were doubtless mesenteric glands. The appendix was subsequently found behind the cæcum. It was three inches in length, reddened, thickened, and club shape, the tip being enlarged. There were no adhesions. No pus was found.

The cavity made by the removal of the glands was then mopped out, and, as no pus had been seen and the peritoneum everywhere appeared normal, the wound was sewed up without drainage. The operation was made under ether. On the morning of the third day a dose of castor oil was given, and this was followed later by a salt and glycerin enema. Vomiting occurred from time to time during the day and bowels moved at 10 P.M. Temperature had once reached 101° F. During the next few days there were some vomiting and a good deal of nausea. The bowels moved naturally and freely. The temperature became normal, and the pulse ranged from 64 to 70. On the morning of the seventh day some of the stitches were removed, and the wound found healed by first intention throughout. The nausea had disappeared, and the only discomfort complained of was a dragging sensation in the right side when he turned over on the left. On the morning of the eighth day the condition was so favorable that I announced that my daily visit would be discontinued. That evening he complained of severe pain in right side, and in the middle of the night the dressings were found saturated with a thin fecal discharge from wound. When seen the next morning the fresh dressings were again saturated, and gas and thin fecal fluid were found escaping from the upper extremity of the incision, the rest appeared firmly united. All of the remaining

stitches were removed, the lips of the upper part of the wound for an inch were separated by forceps, and then at once presented a small bit of sloughing membrane. By night the wound had opened throughout its entire extent, and a portion of gangrenous bowel, apparently the colon and some two or three inches in extent, was hanging out. The temperature rose to  $101.4^{\circ}$  F., but soon reached normal again; the pulse never went above 88.

The next day the projecting mass of sloughing intestine was sundered with scissors; it came from the colon, but did not involve the entire circumference. The pouch removed contained light brown faeces. The next day a further portion of sloughing intestine had escaped from the wound, and was likewise removed; and a day or two afterwards a piece of small intestine nine inches long was washed out of the wound. During this time fluid or mushy faeces was continually escaping from the side, the wound having gaped wide open. There was persistent nausea, and koumiss was the only nourishment retained. The temperature was about normal, the pulse was above 90. The urine was voided in full quantity,—usually voluntarily; but at times the catheter was used. The opening in the bowel at this time could not be seen. From the pieces removed, it was estimated that fifteen inches of small intestine and cæcum had sloughed away. A rise in temperature after a few days occurred, and was followed by the escape of pus from the upper and outer side of the wound; the faeces came from the lower part. From time to time a rise of temperature occurred with the escape of pus. This continued for some days, when a drainage tube was inserted into a small abscess cavity. Drainage being secured, the discharge of pus ceased, and with it the temperature. On April 14 an enema was given and some scybalous faeces removed. Subsequent enemata partly escaped through the wound and were partly returned, but no faecal discharge secured. The wound soon took on a healthy action and filled up and contracted, and after a time the opening in the small intestine from where the faeces escaped could be identified, and the further contraction of the wound brought it nearer the surface. The character of the discharge would vary, dependent upon the condition of the digestion; sometimes a thin, acrid discharge would excoriate the surrounding skin, then there would be simple mushy brown stools, and occasionally curds of milk. For days milk was the principal diet, and for a time

there was a progressive emaciation, which, however, passed away on a more liberal diet. Bismuth, magnesia, and some form of opium had to be resorted to to restrain the action when the discharge became thin. The discharge of feces would occur without the patient's knowledge, and the dressings were changed about four to six times daily.

Thus things continued,—the wound granulating and contracting; there was evident improvement in nutrition; a varied diet was allowed, and the character of the discharge indicated a satisfactory digestion.

As the condition seemed favorable, it was determined to try and relieve the artificial anus by operation. After full consideration, it was determined to establish a connection by lateral anastomosis between the small intestine and sigmoid flexure in the hopes that the greater part of the feces would be diverted, and that subsequently the artificial anus could be dealt with more safely. The patient was prepared, and the operation was made May 19, forty-nine days after the first.

The old wound was first flushed out, and then sewed up tight so as to prevent any contamination by escaping feces. An incision was then made half an inch to the left of the median line and the cavity opened through the rectus muscle. The right side of the abdomen was found well walled off, the rest free of adhesion. The small intestine leading down to the adherent part was somewhat thickened and reddened. It was found difficult to draw up the sigmoid flexure sufficiently on account of a short mesentery, and it was decided therefore to make the anastomosis to the transverse colon. This was drawn down, and a point selected as far away from the opening in the ascending colon as possible. The point selected for the anastomosis in the small intestine was eighteen inches from the adhesion in the right iliac fossa. The anastomosis was made with the O'Hara forceps and the approximation readily accomplished. The loop of intestine leading to the anastomosis was then brought together by some stitches in order to secure sharp angulation at the opening as an extra precaution against the passage of the fecal current beyond the opening in the colon. The abdominal wound was closed without drainage and the original wound reopened.

It was hoped that the lateral anastomosis would carry off the greater part of the fecal current, if not all; the sequel shows

that this hope was not well founded. The day following there was some greenish vomiting, and on changing the dressing over the old wound some mucus and a little pus escaped, and the next day some thin faeces. On the fourth day an enema was given and retained; later the dressing in the side was found saturated with water stained with faeces. On the fifth day a glycerin suppository was inserted at 7 A.M., and again at 6 P.M.; the next day gas was expelled from rectum, and the bowels moved, the motion consisting of small masses of faecal matter and mucus, and the abdominal pain which had been complained of ceased. The temperature once reached 100° F., but most of the time was normal. Enemas brought away small amounts of faeces, the discharge from the artificial anus being nearly as free as ever. May 29 the stitches were removed from the median incision; the next day some foul pus escaped from a stitch opening. This continued to discharge for some days with an increase of temperature. The original wound continued to contract. The faecal discharges were from four to six daily. June 7 there was a motion by rectum, and for several days there were well-formed stools by the natural channel. These, however, soon ceased. For some weeks, however, enema would bring away some faecal matter, but were finally returned unchanged. The lateral anastomosis was therefore a complete failure so far as relieving the artificial anus was concerned. Matters remained unchanged during the summer. The general health improved. Nutrition was good and a number of pounds in weight gained. Sometime in August the patient passed a small phosphatic calculus, and some pus-cells were found in the urine. Subsequently, several other masses were voided. From time to time pain and swelling in the left side with fever left no doubt of the existence of a calculous pyelitis.

On returning from my summer vacation, it was determined to attempt the relief of the artificial anus by uniting the ileum and colon in an end-to-end anastomosis with a Murphy button. This was done October 8,—189 days after the first operation.

The patient had gained a number of pounds of flesh during the summer; looked well; ate freely of whatever he desired, and the character of the stools indicated that it was well digested. The incision from the first operation had contracted to two inches. The opening of the small intestine from which the faeces discharged was raised above the level of the skin and the mucous

membrane everted. A vermicular movement of the mucous membrane always preceded the faecal escape. There were firm adhesions around the small intestine on all sides, except at the upper and outer end of the wound, from which oil injected by the rectum had escaped a few days before, showing that the opening led to the colon.

Chloroform was administered, the patient being a long time in going under. The finger was introduced into the artificial anus, and penetrated about two and one-half inches, when it was blocked apparently by the intestine making a sharp bend. A Nélaton catheter stopped at the same point. The opening was first closed by stitches to prevent the escape of faeces during the operation. The wound was now circumscribed by an incision in normal skin, and the abdomen was opened through the fibres of the rectus muscle. The transverse colon first came into view, and an attempt was made to inspect the site of the lateral anastomosis. This was unsuccessful owing to omental adhesions. The ascending colon was identified. The open end was fixed quite deeply, and freed with a good deal of trouble and brought to the surface. It was found necessary to freely trim the ragged edges before the button could be adjusted, which was done with difficulty, owing to the varying thickness of the tissues. The small intestine was now freed from the adhesion about it. The bowel was thickened, and the peritoneal coat had disappeared from the adhesions. The everted mucous membrane was removed, and the button was adjusted with difficulty owing to the thickness of the tissue. The two sections were brought together without tension and the line of union fortified by some stitches. Strips of iodoform gauze were placed on either side of the bowel and the ends of the wound closed except about two inches.

The operation lasted two hours, and at the end a normal salt solution injection was given. Recovery from the anæsthetic was fairly prompt, but was followed by a good deal of thirst and vomiting. On the third day the gauze was removed, and the same evening a grain of calomel was given, followed the next day by one-tenth grain hourly. Gas began passing by the rectum on the second day, and on the evening of the fifth day there were two free stools at an interval of an hour and a half,—dark colored, pasty, and offensive. On the morning of the sixth some faecal fluid stained the dressings and a fistula was established. Regu-

lar discharges, however, were secured daily by glycerin suppositories, the amount escaping from the fistula varying with the condition of the bowels, averaging probably one-fifth of that by the rectum. The wound rapidly cicatrized until the opening was only large enough for a large sized probe. Later, two attempts were made to close the fistula by operation, the only result being an increase in the amount of discharge for a time. In the mean time there was a serious attack of pyelitis. The temperature varied from 101° to 102° F. A pronounced swelling with pain on pressure occurred over the left kidney, while the urine was found free from pus. Then suddenly occurred a free discharge of pus with the urine and a sudden cessation of all the symptoms, fever and swelling both disappearing. Since then, however, there has always been a trace of pus in the urine. Various colostomy pads were tried in January, 1902, and a final closure of the opening secured by the pressure of a rubber sponge held in place by an elastic bandage around the waist. It is now over fifteen months since there has been any discharge, and the man has been for some time engaged in active business.

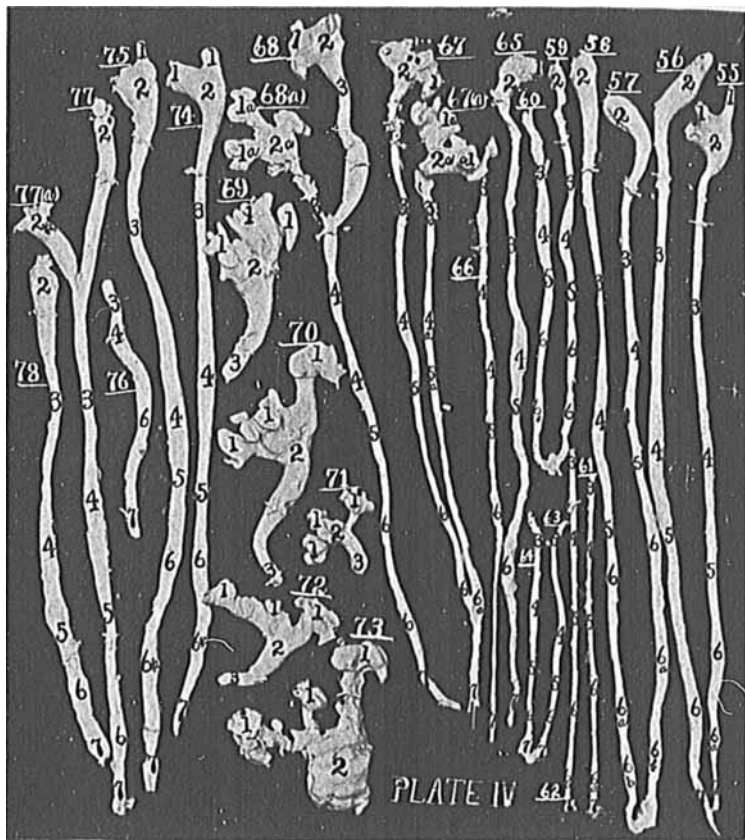
In reviewing this case, it is evident that the glands removed were mesenteric, and that a branch of the ileocecal artery was tied. It seems remarkable that in the presence of advancing gangrene the bowels should have continued to move and the general health maintained,—pulse and temperature remaining normal; and still more remarkable that the gangrenous bowel should have broken through a closed wound and not infected the general peritoneal cavity. The lateral anastomosis proved a complete failure in relieving the artificial anus. The local conditions at that time were such that an end-to-end anastomosis between the artificial anus and the ascending colon seemed impossible without contamination of the peritoneum, and the union of small intestine and transverse colon seemed to offer a good chance for amelioration and marked diminution of discharge from side, if not complete success, and with comparatively little danger. The change in the local condition effected by the contraction of the wound was most marked. The opening in the small intestine from

which the feces escaped was brought up beyond the level of the skin, so that it could be easily closed by stitches as a preliminary step in the operation. The ends of the bowel did not, it must be confessed, appear in good condition for the use of the button; in the small intestine the peritoneal coat had been completely destroyed by granulations, and over the colon partly so. This condition possibly explained the resulting fistula; owing to the uneven thickening of the tissues, the two sections of the button were brought together with great difficulty.

At another time I should not attempt the lateral anastomosis, but wait until the process of repair had placed the local condition in a state favorable for the end-to-end operation.

The pressure from an India rubber sponge effected the final closure after failure by the colostomy pad. The Murphy button was never heard from.





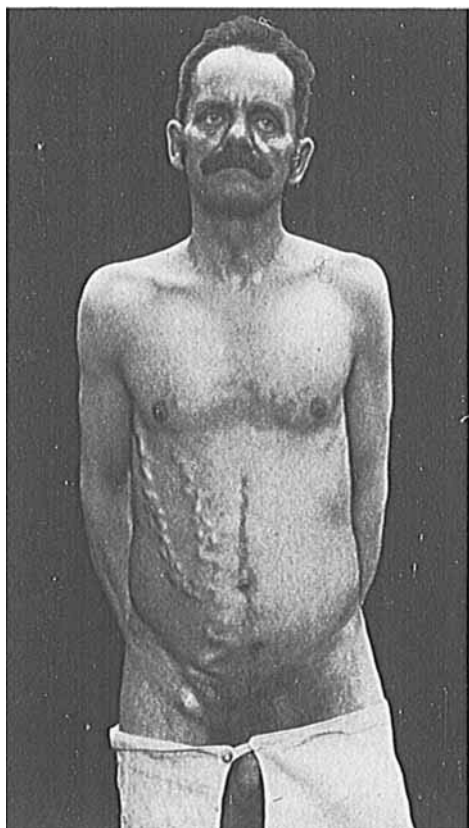


FIG. 2. -R. P. three and one-half years after operation. Shows the enlargement of the epigastric vein on the right side. The wearing of a truss has prevented the enlargement of the corresponding vein on the left side.